ASTRONOMY

Venus Brilliant in Evenings

In January Venus will draw farthest to the east of the sun, shining brightly. Mars is in Gemini, but Mercury, Jupiter and Saturn cannot be seen, James Stokley reports.

➤ DURING JANUARY the planet Venus will draw farthest to the east of the sun, thereby remaining visible in the western sky long after the sun has set. It is so brilliant (magnitude minus 3.9 on the astronomical brightness scale) that it is very easy to locate. It appears long before any other planet or star.

The accompanying maps show the appearance of the skies at about 10 p.m., your own kind of standard time, at the beginning of January; 9:00 p.m. at the middle and 8:00 p.m. at the end. Thus, in the first part of January, Venus sets too early to gain a place on the maps; its approximate position in the western sky is shown for the end of January. Since it is moving rapidly, its place among the stars changes from day to day.

Another planet is also shown. This is Mars, standing high in the south in Gemini, the twins. Although it is only about a fifteenth as bright as Venus, it is still more brilliant than any star, except for Sirius, which is lower in the sky.

Sirius Brightest Star

Sirius is the brightest of the stars which, like the sun, shine with their own light. The planets, on the other hand, shine with reflected sunlight.

Above and to the right of Sirius, which is part of Canis Major, the great dog, we find the constellation of Orion, the warrior. Here you see three stars in a row—Orion's belt. Above them is Betelgeuse, and below Rigel, both stars of the first magnitude. Still higher and farther right is Taurus, the bull, with brilliant Aldebaran. And directly overhead stands Auriga, the charioteer, in which Capella is the brightest star.

From here, descending toward the east, we come to Gemini, the twins, with Castor and Pollux. The latter is of the first magnitude, the former of the second. And below Gemini stands Canis Minor, the lesser dog, with Procyon.

Moving toward the left, so that we are now on the map of the northern half of the sky, we come to Leo, the lion, which is now beginning to appear again in the evening sky. In it is the star Regulus. This appears somewhat fainter than normal because of its low altitude and the absorption of its light by the greater thickness of air that it has to penetrate. A similar—and even greater—reduction of light occurs with Deneb, in Cygnus, the swan, which stands close to the northwestern horizon.

The other planets that are also sometimes visible to the naked eye, Mercury, Jupiter and Saturn, are not visible in January because they are too nearly in line with the sun. Mercury is in superior conjunction (behind the sun) on Jan. 5, while Jupiter comes into a similar position on the same day, a few hours earlier. So does Saturn, on Jan. 11. Thus, during all of January, these planets will be so close to the sun's direction that we will not be able to see them.

On Jan. 2 the earth is nearest the sun, or at perihelion, only 91,337,000 miles away. This is about three million miles closer than it will be in July, when the earth is at aphelion (farthest from the sun). For us in the Northern Hemisphere the sun is now low in the sky, even at noon. Its rays fall upon the ground at a very low angle. They are not as concentrated as in June and July, when the noonday sun climbs well overhead. That is why we now have cold weather, even though the sun is at its closest for the year.

With the beginning of a new year those of us who use the Gregorian calendar start writing 1961 when we put down a date. That is the number of the year A.D., Anno Domini, supposedly measured from the birth of Christ. Actually, however, Christ was born at least as early as 4 B.C., by our reckoning, and perhaps several years earlier than that.

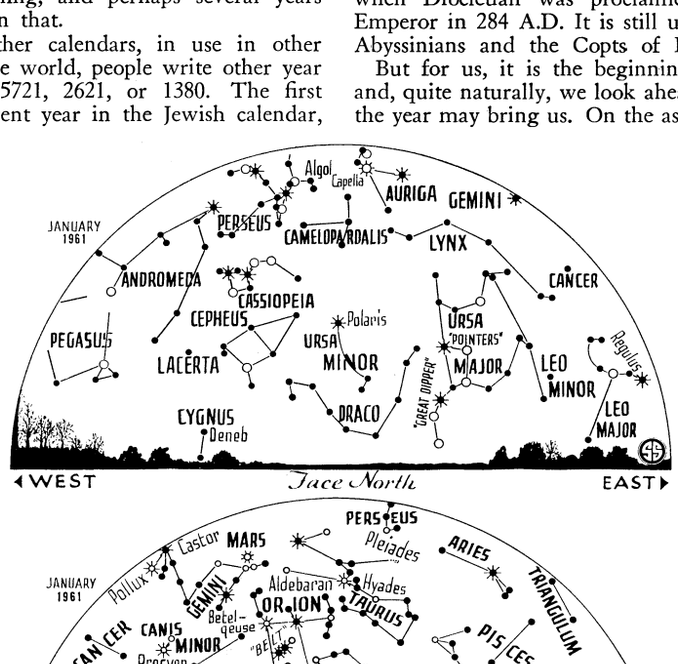
With other calendars, in use in other parts of the world, people write other year numbers: 5721, 2621, or 1380. The first is the current year in the Jewish calendar, as measured from the supposed date of the creation. The new Jewish year, 5722, will begin Sept. 11. In Japan, the new year, 2621, begins on the same day as our new year. And in Mohammedan countries the year 1381, measured from the Hegira, Mohammed's flight from Mecca, begins June 15. The Hegira occurred in 622 A.D. The Mohammedan year is about ten days shorter than ours. That is why 1381 and 622 do not add up to 1961.

By other calendars—some no longer in use—we have quite a variety of year numbers. In the old Byzantine calendar it is now 7469; 7470 will start Sept. 14. By the one used in ancient Rome the year 2714 A.U.C. ("ab urbe condita"—from the founding of the city) starts on Jan. 14. If anyone still used the Babylonian calendar, which reckoned from Nabonassar, one of their early kings, he would celebrate the beginning of 2710 on May 3.

Year 2273 in Asia

In the era of the Seleucidae, following a calendar long used in western Asia, 2273 will commence on Sept. 14 or Oct. 14, depending on which of two reckonings is used. New Year's Day, by the Indian Saka calendar, will come March 22, with the start of 1883. And in the era of Diocletian 1678 will start on Sept. 11. This era began when Diocletian was proclaimed Roman Emperor in 284 A.D. It is still used by the Abyssinians and the Copts of Egypt.

But for us, it is the beginning of 1961, and, quite naturally, we look ahead to what the year may bring us. On the astronomical



☼ ✷ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

program, there will be four eclipses: two of the sun, two of the moon. First comes a total solar eclipse, visible along a belt crossing southern Europe and Russia, on Feb. 15. Over all of Europe, northern Africa and most of Asia, there will be a partial eclipse. Then will come a partial eclipse of the moon on March 2, partly visible, at least, over most of North America.

The second eclipse of the sun will come Aug. 11. This will be annular. That is, the moon will not completely hide the sun, but will leave visible a ring of the solar surface, around the dark lunar disc. This occurs even where the eclipse is at a maximum, in the South Atlantic, near Antarctica. The second lunar eclipse, also partial, will come on Aug. 26 and will be visible generally from North and South America.

When the moon passes in front of a star or planet, it is called an "occultation" rather than an eclipse. Several times Mercury is thus occulted and on one of these occasions, on March 14, it will be visible, with some difficulty, from North America. There will be a number of occultations of Aldebaran, in Taurus, and Regulus, in Leo. Several of these will be visible from this part of the world.

Mercury will be visible, low in the western evening sky, about June 1. Venus will continue to shine brightly in the west until the end of March; from the end of April through the rest of the year it will appear in the eastern sky in the morning. Mars, so bright at the start of the year, will continue to be visible, but will become considerably fainter in the following months. Jupiter, during the spring, will be in the morning sky, but by fall it will be prominent in the evening. Saturn will follow a nearly similar program.

Celestial Time Table for January

Jan.	EST.	
1	Noon	Moon passes Mars
	6.06 p.m.	Full moon
2		Earth nearest sun, distance 91,337,000 miles
3	8:00 a.m.	Moon farthest, distance 252,500 miles
5	1:00 p.m.	Jupiter behind sun
	6:00 p.m.	Mercury behind sun
9	10.03 p.m.	Moon in last quarter
11	1:00 a.m.	Saturn behind sun
15	1:57 a.m.	Algol (variable star in Perseus) at minimum brightness
16	4.30 p.m.	New moon
	6:00 p.m.	Moon nearest, distance 221,600 miles
17	10:46 p.m.	Algol at minimum
19	Midnight	Moon passes Venus
20	7:35 p.m.	Algol at minimum
23	11:14 a.m.	Moon in first quarter
	4:24 p.m.	Algol at minimum
28	2:00 a.m.	Moon passes Mars
29	2:00 a.m.	Venus farthest east of sun
30	8:00 a.m.	Moon farthest, distance 252,500 miles
31	1:47 p.m.	Full moon

Subtract one hour for CST, two hours for MST, and three for PST.

• Science News Letter, 78:426 December 24, 1960

PHYSIOLOGY

Man Can Adjust to Cold

➤ DEATH IS NOT a necessary result of very low body temperature. It is probable that man can adjust to cold as well as to heat.

Steven M. Horvath of The Lankenau Hospital, Philadelphia, told the American Society of Mechanical Engineers in New York that "shivering hairless man can get along pretty well in extreme cold."

Mr. Horvath said recovery from body temperatures as low as nine degrees centigrade, or 48 degrees Fahrenheit, have been recorded. Some animal experiments indicate that under certain conditions body temperatures can be lowered to zero degrees centigrade, or 32 degrees Fahrenheit, or even slightly lower with complete recovery even though the heart has not been functioning for some minutes.

He said there is no such thing as a constant body temperature, since variations up to 10 degrees are found in the human body. The temperature that scientists are interested in controlling primarily is that of such deep central areas as in the heart, lungs and brain.

Arctic and Antarctic explorers have often suggested development of an acclimation process, he said, and there is some evidence that "certain local mechanisms" do improve with continued cold exposure. But it has not been easy to separate the influence of the use of clothing and other protective devices from the physiological factors.

• Science News Letter, 78:427 December 24, 1960

PHYSIOLOGY

Teen-Agers Are Heavier

➤ TODAY'S UNITED STATES teen-agers are taller and heavier than those of earlier generations, statisticians of the Metropolitan Life Insurance Company in New York have found.

They compared height-weight information for teen-agers applying for insurance between 1935 and 1953 with that from those insured between 1885 and 1900. Average height of boys 15 to 16 years old is 1.8 inches greater than in the earlier time. For boys at ages 17 to 19, the gain was 1.6 inches.

For girls, the corresponding increases in average height were six-tenths and four-tenths of an inch in the respective age groups.

The greater height and weight of the present generation of teen-agers reflects primarily better nutrition, advances in medicine and public health, and generally higher standards of living.

To some extent, however, the growth trends are due to the attainment of physical maturity at a somewhat younger age, on the average, than in earlier generations.

• Science News Letter, 78:427 December 24, 1960